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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,199	12/16/2003	William G. Thorburn	MCE04-18	8790
22468	7590	09/16/2005		
CHAPIN & HUANG L.L.C. WESTBOROUGH OFFICE PARK 1700 WEST PARK DRIVE WESTBOROUGH, MA 01581			EXAMINER LUU, THANH X	
			ART UNIT 2878	PAPER NUMBER

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/737,199

Applicant(s)

THORBURN, WILLIAM G.

Examiner

Thanh X. Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/2004;08/2004.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the transmissive embodiment, the aperture, the lens, the three beams of light must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 14-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention

It is unclear to one of ordinary skill in the art how to make a transmissive embodiment of the invention wherein the sensor head comprising the light source and the plurality of light detecting elements are on the same first member and the offset light beam is returned to the sensor head via a transmissive beam generation element.

4. Claims 14-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It appears that Applicant has failed to describe an embodiment in which a transmissive beam generation element is used and wherein the sensor head comprising the light source and the plurality of light detecting elements are on the same first member and the offset light beam is returned to the sensor head.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 4-12, 14, 17-20, 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamamoto et al. (U.S. Patent Application Publication 2002/0014581).

Regarding claims 1, 2, 4-12, 14, 17-20, 23, Yamamoto et al. disclose (see Fig. 44) a measurement apparatus for determining an angular position of a first member with respect to a second member about a rotation axis, comprising: an optical sensor head on the first member (406), the sensor head comprising a source of a light beam (402) and a plurality of light detecting elements (412); an offset beam generation element (410) on the second member (404), the generation element being operative to receive the light beam and to return an offset light beam to the sensor head, the offset light beam providing a light spot that travels in a generally elliptical path (416) over the light detecting elements as relative rotation occurs between the first and second members; and a signal processor (not shown) operative to process electrical signals produced by the detecting elements to determine the position of the offset beam along the elliptical path. Yamamoto et al. further disclose (see paragraph 0475) the light source is an LED and (see paragraph 0665) the beam generation element is a reflective diffractive optical element as claimed. The diffractive element inherently creates first and second beams diffracted at different orders and creating a unique beam (an order) as claimed. In

addition, Yamamoto et al. disclose (see paragraph 0665) the element is transmissive (transparent substrate 310).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. in view of Hasser (U.S. Patent 6,564,168).

Regarding claim 3, Yamamoto et al. disclose the claimed invention as set forth above. Yamamoto et al. further disclose (see paragraph 0475) a surface emitting laser. Yamamoto et al. do not specifically disclose a vertical cavity surface emitting laser (VCSEL) as claimed. Hasser discloses (see Figs. 3 and 4) using VCSELs in a device to detect rotary motion to provide more efficient and less expensive illumination. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a VCSEL in the apparatus of Yamamoto et al. as taught.

9. Claims 13, 15, 16, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al.

Regarding claim 13, Yamamoto et al. disclose the claimed invention as set forth above. Yamamoto et al. do not specifically disclose a binary diffuser as claimed. However, choosing the type of diffractive optical element is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention

was made to provide binary diffuser in the apparatus of Yamamoto et al. to obtain a more uniform diffusion as desired.

Regarding claims 15 and 16, Yamamoto et al. disclose the claimed invention as set forth above. Yamamoto et al. do not specifically disclose transmissive embodiment as claimed. However, it is notoriously well known in the art that transmissive and reflective embodiments are equivalent and choosing a particular embodiment requires only routine skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a transmissive in the apparatus of Yamamoto et al. to reduce interference from the light source and improve detection.

Regarding claims 21 and 22, Yamamoto et al. disclose the claimed invention as set forth above. Yamamoto et al. do not specifically disclose an aperture or a lens as claimed. However, apertures and lens are notoriously well known in the art to control spot size. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an aperture or lens in the apparatus of Yamamoto et al. obtain a desired spot size for improved detection.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is 571-272-2441. The examiner can normally be reached on M-F 6:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thanh X Luu
Primary Examiner
Art Unit 2878

09/2005